

# **VACUUM COLLECTOR HAVING SWEEPING DEVICE**

## **BACKGROUND OF THE INVENTION**

### 1. Field of the Invention

5 The present invention relates to a vacuum collector, and more particularly to a vacuum collector having a stirring or sweeping device disposed in a screen filter member, for sweeping dirt from the screen filter member and for allowing the dirt to be easily collected.

### 2. Description of the Prior Art

10 Typical vacuum collectors comprise a duct arm or a trunk for directing toward the dust or dirt or fume to be collected, an electric vacuum motor or pump for vacuuming or drawing the dust or dirt or fume into or through the duct arm or the trunk, and a screen filter member attached to one end of the duct arm or the trunk for  
15 receiving and collecting the dirt.

For example, U.S. Patent No. 5,159,737 to Kimura et al. discloses one of the typical vacuum collectors having an adapter duct coupled to a base duct for directing toward the dust or dirt or fume to be collected.

20 U.S. Patent No. 5,519,915 to Hollowell discloses another typical vacuum collector attached to a vehicle and having a boom height adjusting device.

U.S. Patent No. 6,081,961 to Wang discloses a further typical vacuum collector which is portable or movable for being used in  
25 house families, etc.

However, in the typical vacuum collectors, the screen filter members are simply attached to one end of the duct arm or the trunk

for receiving and collecting the dirt. After use, the dirt or dust may be attached onto the screen filter member, and may thus block the screen filter member, such that the dirt or dust may not be effectively drawn or vacuumed into the screen filter member after  
5 working for a period of time.

In the typical vacuum collectors, no stirring or sweeping devices have been provided or disposed in the screen filter member for sweeping dirt from the screen filter member and for allowing the dirt to be easily collected.

10 The present invention has arisen to mitigate and/or obviate the afore-described disadvantages of the conventional vacuum collectors.

### **SUMMARY OF THE INVENTION**

The primary objective of the present invention is to provide a  
15 vacuum collector including a stirring or sweeping device disposed in a screen filter member, for sweeping dirt from the screen filter member and for allowing the dirt to be easily collected.

In accordance with one aspect of the invention, there is provided a vacuum collector comprising a filter housing, a filter  
20 member disposed in the filter housing, and means for sweeping the filter member, to sweep of dirt from the filter member, and to allow the dirt to be removed from the filter member and to be collected.

The sweeping means includes at least one flap rotatably disposed in the filter member for engaging with the filter member to  
25 sweep of dirt from the filter member when the flap is rotated relative to the filter member. The filter housing includes a shaft rotatably disposed therein to support the flap.

The filter housing includes an upper panel and a bottom bar, the shaft is rotatably disposed between the upper panel and the bar of the filter housing. The filter housing includes two seats attached to the upper panel and the bottom bar, to rotatably support the shaft  
5 between the upper panel and the bar of the filter housing.

The shaft preferably includes a non-circular cross section having at least one flat surface formed thereon to solidly attach the flap to the shaft.

One or more blades may further be provided and attached to  
10 the flap, for engaging with the filter member. An adjusting device may further be provided for adjusting the blade relative to the flap. The adjusting device includes at least one oblong hole formed in the flap, and a fastener adjustably engaging through the oblong hole of the flap, and engaged with the blade, to adjustably secure the blade  
15 to the flap.

A duct may further be provided and the filter housing is disposed on the duct, and a vacuum pump may further be provided and coupled to the duct for drawing the dirt into the filter housing via the duct. A dust bag may further be provided and attached to the  
20 duct and disposed below the filter housing to collect the dirt.

Further objectives and advantages of the present invention will become apparent from a careful reading of the detailed description provided hereinbelow, with appropriate reference to the accompanying drawings.

## 25            **BRIEF DESCRIPTION OF THE DRAWINGS**

FIG. 1 is a perspective view of a vacuum collector in accordance with the present invention;

FIG. 2 is an exploded view of a filter device for the vacuum collector;

FIG. 3 is a perspective view of the filter device for the vacuum collector;

5        FIG. 4 is a bottom plan view of the filter device for the vacuum collector;

FIG. 5 is an enlarged partial bottom plan view of the filter device; and

FIG. 6 is an exploded view similar to FIG. 2, illustrating the  
10    other arrangement of the vacuum collector.

#### **DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT**

Referring to the drawings, and initially to FIG. 1, a vacuum collector in accordance with the present invention comprises a base 10, an electric vacuum motor or pump 11 disposed on the base 10  
15    for vacuuming purposes, one or more, such as two ducts 12 disposed on the base 10 and coupled to the vacuum pump 11 with manifolds 13, and one or more, such as two filter devices 3 attached to the ducts 12 for filtering purposes.

The vacuum pump 11 includes one or more ports 14 for  
20    coupling to trunks or duct arms or nozzles (not shown) or the like, and for directing toward the dust or dirt or fume to be collected, in order to vacuum or to draw the dust or the dirt or the fume through the manifolds 13 and the ducts 12 and then into the filter devices 3 which may be provided for filtering and/or collecting the dust or the  
25    dirt.

The filter devices 3 may be attached onto the ducts 12 with such as clamping or retaining rings 15, and preferably disposed

above the ducts 12 respectively. One or more, such as two dust bags 20 may further be provided and attached onto the ducts 12 with such as clamping or retaining rings 21, and preferably disposed below the ducts 12 and the filter devices 3 respectively, for collecting the dust or the dirt filtered and/or collected by the filter devices 3.

The present invention is to improve the filter devices 3, and to provide a filter member 31 in a filter housing 30, and a stirring or sweeping device 40 (FIGS. 2 and 4-6) disposed in the filter member 31, for sweeping the dust or the dirt from the filter member 31 and for allowing the dust or the dirt to be easily removed from the filter member 31 and/or to be easily collected within the dust bag 20.

As shown in FIGS. 2-5, the filter member 31 is disposed in the filter housing 30, and preferably snugly fitted within the filter housing 30, or contacted with an inner peripheral surface 32 of the filter housing 30, best shown in FIGS. 4 and 5. It is preferable that the filter member 31 includes a serrated structure having a number of cusps 33 formed therein and extended inwardly into an inner chamber 34 of the filter member 31, and having a number of recesses 35 formed or defined between the cusps 33.

The filter housing 30 includes an upper panel 36, and includes a bar 37 attached to the bottom portion thereof, and includes two hubs or seats 39 attached to the upper panel 36 and the bar 37 respectively. The sweeping device 40 includes a shaft 41 rotatably disposed in the filter member 31 and in the filter housing 30, and the shaft 41 includes two ends rotatably secured to the seats 39 with such as bearings 42 or the like.

It is preferable that the shaft 41 includes a non-circular cross

section, such as a triangular cross section, a square or rectangular cross section, a hexagonal cross section as shown in dotted lines in FIG. 4, or the like, such that the shaft 41 may include two or more flat surfaces 43 formed thereon.

5       The sweeping device 40 further includes one or more flaps 44 secured onto the shaft 41, such as secured onto the flat surfaces 43 of the shaft 41. For example, as shown in FIGS. 2 and 4, when the shaft 41 includes a triangular or a hexagonal cross section having three or six flat surfaces 43 formed thereon, the flaps 44 may be  
10       secured onto the shaft 41 and arranged to have a 120° included angle formed therebetween.

      The sweeping device 40 further includes one or more blades 45 of such as rubber or resilient materials secured to the free ends of the flaps 44 with such as fasteners 46, for engaging with the filter  
15       member 31, such as for engaging with the cusps 33 of the filter member 31, in order to stir or to sweep off the dust or the dirt that may be attached onto the filter member 31, and thus for allowing the dust or the dirt to be collected within the dust bag 20.

      As shown in FIGS. 2 and 6, each of the flaps 44 may include  
20       one or more oblong holes 47 formed therein, for slidably or adjustably receiving the fasteners 46, and thus for allowing the blades 45 to be slightly adjusted toward or away from the flaps 44 respectively, in order to adjust the contacting or the engagement of the resilient blades 45 with the filter member 31, and thus for  
25       allowing the resilient blades 45 to effectively sweep the dust or the dirt from the filter member 31.

      As also shown in FIG. 2, the sweeping device 40 may include

one or more flaps 44 secured onto the shaft 41, and one or more further flaps 44 secured onto the shaft 41 and disposed above or below the other flaps 44, when the filter member 31 includes a greater length or height that may not be effectively contacted or swept by the flaps 44 disposed on a predetermined height relative to the filter member 31.

As shown in FIG. 6, when the filter member 31 includes a shorter length or height, the flaps 44 that are disposed on a predetermined height relative to the filter member 31 may be good enough to effectively contact or sweep the filter member 31, and to remove the dust and the dirt from the filter member 31. It is to be noted that the flaps 44 themselves may also be made of rubber or resilient materials for resiliently engaging with the filter member 31.

A handle 48 may include one end 49 secured to one end of the shaft 41, in order to rotate the shaft 41 and thus the flaps 44 and the blades 45 relative to the filter member 31, in order to remove the dust and the dirt from the filter member 31. When three flaps 44 and three blades 45 are secured to the shaft 41 and spaced for 120° away from each other, it is only required to rotate the handle 48 for 120° relative to the filter member 31, and to sweep the filter member 31 for one circle.

Accordingly, the vacuum collector in accordance with the present invention includes a stirring or sweeping device disposed in a screen filter member, for sweeping dirt from the screen filter member and for allowing the dirt to be easily collected.

Although this invention has been described with a certain

degree of particularity, it is to be understood that the present disclosure has been made by way of example only and that numerous changes in the detailed construction and the combination and arrangement of parts may be resorted to without departing from  
5 the spirit and scope of the invention as hereinafter claimed.